Project Introduction

The remote sensing reflectance signal measured by an ocean color satellite is to first order proportional to the ratio of backscattered to absorbed light. Therefore in situ measurements of absorption and backscattering, as functions of wavelength, along with in situ and satellite radiometry, are key to refinement and calibration of legacy ocean color algorithms, as well as development of next generation ocean color products such as phytoplankton functional type. Currently, commercial instruments exist for in situ measurement of the hyperspectral absorption coefficient, but no instrument exists for measurement of the hyperspectral backscattering coefficient. We propose to develop an active sensor for in situ measurement of the hyperspectral backscattering coefficient. The proposed instrument will use a broadband halogen lamp source, servo-controlled linear variable filters as spectral bandpass elements in transmit and receive optics, and a photomultiplier tube detector with integrated low-noise amplifier and variable gain. The proposed instrument addresses a critical gap in the field of currently available systems for measuring hyperspectral IOPs in situ, in support of hyperspectral ocean color missions.

Primary U.S. Work Locations and Key Partners

Investigating an Instrument for Measurement of Hyperspectral Backscattering in Natural Waters, Phase II Briefing Chart Image
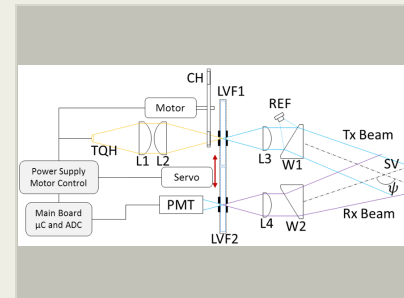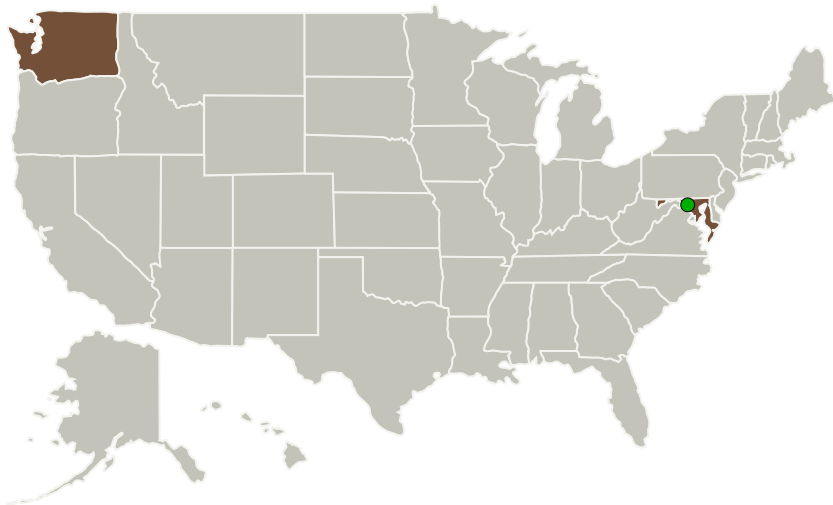
Table of Contents

TechPort

Printed on 12/23/2022
11:49 AM UTC

For more information and an accessible alternative, please visit:
https://techport.nasa.gov/view/93580

Page 1

Investigating an Instrument for Measurement of Hyperspectral Backscattering in Natural Waters, Phase II

Completed Technology Project (2017 - 2019)

Organizations Performing Work	Role	Type	Location
Sequoia Scientific, Inc.	Lead Organization	Industry	Bellevue, Washington
🟢 Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Washington

Project Transitions

▶ **April 2017:** Project Start

✔ **July 2019:** Closed out

    Closeout Documentation:
- Final Summary Chart*(https://techport.nasa.gov/file/140829)*
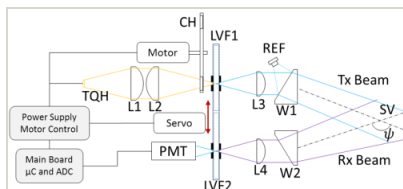
Images

Briefing Chart Image
Investigating an Instrument for Measurement of Hyperspectral Backscattering in Natural Waters, Phase II Briefing Chart Image
(https://techport.nasa.gov/image/131081)

Final Summary Chart Image
Investigating an Instrument for Measurement of Hyperspectral Backscattering in Natural Waters, Phase II
(https://techport.nasa.gov/image/128663)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Sequoia Scientific, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
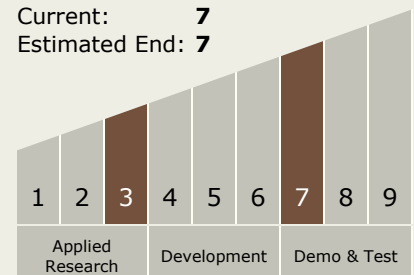Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Wayne H Slade

Technology Maturity (TRL)

Start: **3**
Current: **7**
Estimated End: **7**

1	2	3	4	5	6	7	8	9
		Applied Research		Development			Demo & Test	

TechPort

Printed on 12/23/2022
11:49 AM UTC

For more information and an accessible alternative, please visit:
https://techport.nasa.gov/view/93580

Page 2

Technology Areas

Primary:

- TX08 Sensors and Instruments
  └ TX08.1 Remote Sensing Instruments/Sensors
    └ TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System